E3G

SUBMISSION MAY 2023

A NEW GENERATION ENERGY SYSTEM: RETHINKING ENERGY TO ACCELERATE JUST TRANSITION

SUBMISSION TO THE MITIGATION WORK PROGRAM GLOBAL DIALOGUES

Local, efficient energy systems are the missing ingredient to accelerate just energy transitions. Such systems will integrate renewables, storage, and efficient appliances. They will work seamlessly with centralised systems. However, despite gaining ground, they face barriers to scaling up. Parties can accelerate a smooth transition, and realise the benefits of new energy systems, by enabling the necessary market and regulatory changes.

Summary

A new generation of energy system is coming. The way we make, model, and manage our energy needs and security will increasingly include local, integrated, and efficient solutions. This will complement the large centralised clean power systems we are used to, because local, efficient energy can move at pace to meet people's needs, as well as support grids with flexibility services.

However, these local solutions face common barriers. They are often seen as individual technologies, small, niche, difficult to scale. Existing legislation, permitting requirements, business models, and financing are designed for utility-scale projects, not for distributed solutions. This slows the expansion and scaling of distributed solutions. To accelerate a just energy transition, the Conference of the Parties of the UNFCCC ("Parties") must foster dialogue on how to address these barriers and collectively explore the implications of a new system in terms of how energy is envisioned, planned, regulated, and financed.

The MWP Global Dialogues can enable a new energy system addressing the trade-offs of security, affordability, and sustainability, and accelerating the just energy transition by actioning the following:

1. Parties should expand their understanding and definition of what is needed in energy systems planning by including this new generation of energy systems as key to accelerating a just energy transition, including reaching climate targets, providing energy security, and achieving sustainable development goals.
2. Parties should acknowledge the reform and innovation needed in energy policy and regulations to accommodate local, integrated, efficient energy systems, including developing the appropriate national guidelines to address common challenges such as permitting, finance, and local supply chains.
3. Parties should enable sharing of best practices: focusing MWP discussion on topics including improving consistency in standards and conventions in distributed technologies; fostering technology transfer and innovation to ensure shared benefits and resilient development, for instance by building local value chains.
4. Parties should call on international financial institutions (IFIs), including multilateral development banks (MDBs), to increase coordination with other financiers to fill data gaps, co-develop programmes, and share best practices. Parties should also call on IFIs to strengthen partnerships with national and sub-national financial institutions to effectively channel the much-needed finance for these solutions, while enhancing transparency and standardisation.
5. Parties, with non-state actors, should collaborate to deliver community engagement and education campaigns to improve energy literacy and enhance agency in energy system decision-making.

A new generation of energy system: local, integrated, efficient

There is an economic and political groundswell for the new generation of energy systems, with hard targets for net zero power systems, rising solar PV deployment rates, and falling costs for batteries. Yet we risk missing the deadline to achieve universal energy access by 2030. Now is the moment to rally around this new generation of energy systems and build the political ambition to deliver on its promise.

The global dialogue bridging development and energy transition conversations is taking place across multiple venues including the UNFCCC's Mitigation Work Program (MWP). Operating, as it does, at the intersection of development and climate, the MWP can address mechanisms, and remove barriers, that will drive through this new generation of energy, ensuring we can achieve secure, resilient systems that are affordable and net zero aligned.

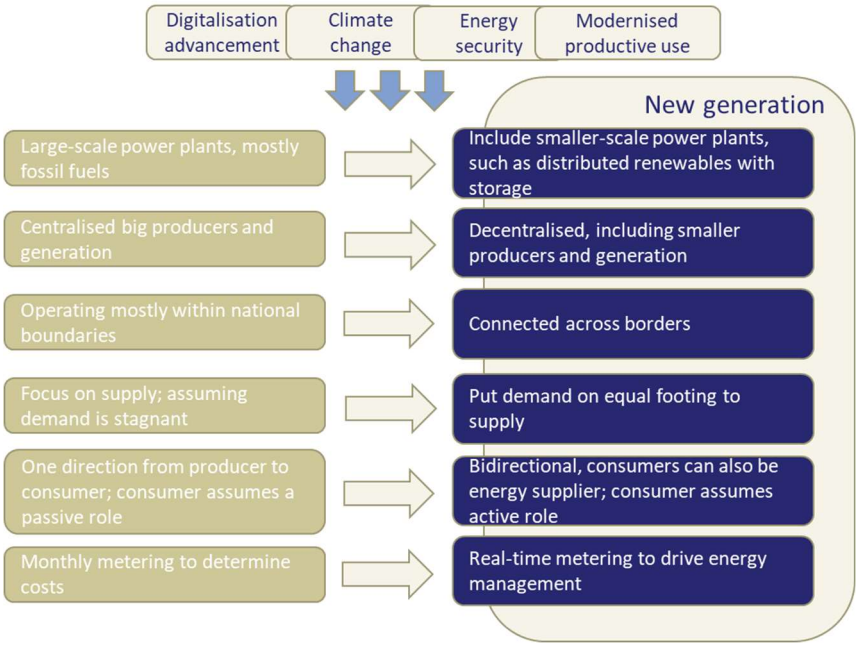

Figure 1: The structural changes emerging in the energy system

The new generation of energy system expands the definition of critical energy system functions, develops how energy demand is managed and planned for and provides a new understanding of how we build resilient and secure energy systems. This builds on the foundations of our current energy system, extending three new pillars that will achieve the multiple goals of energy affordability, equity, and net zero:

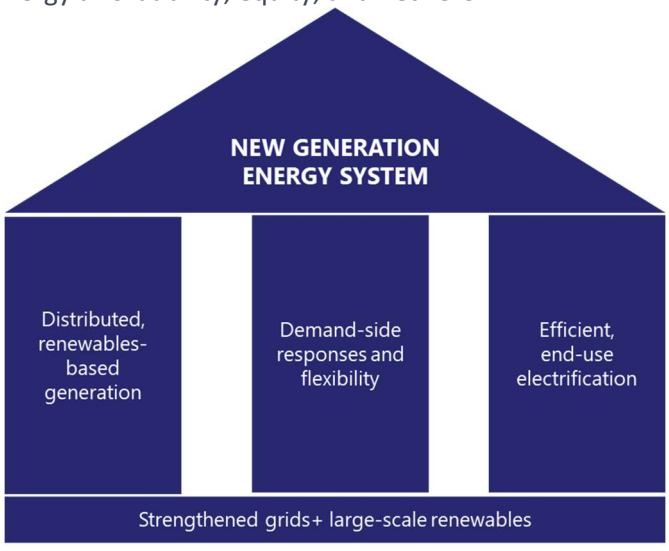

Figure 2: Pillars for a local, efficient, integrated energy system grounded in distributed, responsive solutions

- **Distributed, renewables-based generation**: the new era shifts from dependence on centralised, large-scale power production and distribution, to include smaller, decentralised, distributed power producers.
- **Efficient, end-use electrification**: decentralised, decarbonised power will require rapid growth in end-use electrification. This creates more efficient systems, expands access and extends services to previously underserved communities, and allows energy users to control and engage their systems more.
- **Demand-side response and flexibility**: a decentralised and largely electrified system both requires and allows demand response and requires flexibility to address the intermittency of renewables and meet fluctuating demand e.g., high cooling demand during extreme heat events.

Opportunities

Bringing together centralised and decentralised energy solutions not only accelerates the just energy transition, but also fosters an energy system that will be:

- **Efficient and resilient**: integrated, distributed energy systems help increase grid flexibility and resilience, for example by continuing to operate during a main grid outage. Electric technology has higher efficiency compared to fossil fuel-based technologies, and distributed energy systems can reduce reliance on imports.
- **Affordable**: distributed technologies can diffuse faster and be adopted more quickly than large-scale technologies. They have lower unit costs, and demand less access to capital, especially when supported by economies of scale and risk mitigation mechanisms. More efficient systems also reduce customers' bills.[1]
- **Equitable**: distributed systems can more quickly reach rural and peri-urban communities currently without reliable electricity, and provide local developers and communities more access to technologies. They generate more jobs; empower customer engagement; support resilient agri-food systems; and deliver better access to healthcare, clean water, and education.[2]
- **Net zero aligned**: distributed renewables such as solar, wind, and air-source heat pumps at scale contribute to net zero and, when integrated, enable the mitigation potential of demand-side measures that can lower emissions in the power sector by 70% by 2050.[3]

Barriers

Distributed solutions are often seen as individual technologies, small or niche, difficult to scale. Existing legislation, permitting requirements, business models, and financing are often built for utility-scale projects and are not fit for purpose for distributed solutions. These barriers slows the expansion and scale of distributed solutions:

- **The current system is not designed to incorporate distributed systems**. Lack of markets tailored for smaller solutions results in high entry costs, including hurdles to securing finance, permitting, and generating stable income.[4] Market design frameworks tend to have a requirement for minimum bid sizes, excluding distributed energy. Under current frameworks, developing mini-grids at scale would need 12,000 separate mini-grid deals.[5] This cumbersome process makes it difficult and expensive for financiers to deploy necessary capital, slowing commitments to the sector.[6]
- **Local systems lack political attention to deliver a more suitable policy framework.** Politically, distributed solutions attract less support when compared to large power plants. Governments often need a set of new

[1] Wilson et al., 2020, **Granular technologies to accelerate decarbonization**

[2] AMDA, 2022, **Benchmarking Africa's Minigrids Report**; Efficiency for Access, **Agriculture and Energy Efficiency**; Ingram et al., 2022; **Improving Rural Livelihoods, Energy Access, and Resilience Where It's Needed Most: The Case for Solar Mini-Grid Irrigation in Ethiopia**; Power for All, 2022, **Powering Jobs Census 2022**; Wilson et al., 2020, **Granular technologies to accelerate decarbonization;** The Rockefeller Foundation, 2021, **Transforming a Billion Lives: The Job Creation Potential from a Green Power Transition in the Energy Poor World**

[3] IPCC, 2022, **Climate Change 2022: Mitigation of Climate Change - Working Group III contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change**

[4] UKRI, 2023, **Smart local energy systems: Insights from UKRI-funded innovation projects**

[5] AMDA, 2023, Minigrid Learning Event

[6] E3G, 2022, **How multilateral development banks can boost small-scale energy solutions** ; Project LEO, 2021, **Policy and Regulatory Review**

skills and technologies to deploy the solutions, which are in competition with other priorities. Many of these solutions are seen as overly technical by decision-makers, as has been the case for efficiency, flexibility, integration, and – to a lesser degree – digitisation and smart technologies. The lack of clear, long-term direction-setting hampers investor confidence and raises the issue of interoperability between different energy solutions.

- **Minimal awareness, and a lack of skilled labour and knowledge ecosystem, are hindering advancement in technology and innovation.** Low awareness of the importance of distributed solutions and integration leads to a persistent lack of skilled labour, resulting in fewer products and services suitable for smaller end users.

Enabling a New Generation Energy System: Recommendations for the MWP Global Dialogues on Accelerating a Just Energy Transition

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3. Parties, via the MWP dialogue, should enable sharing of best practices: focusing discussion on topics including improving consistency in standards and conventions in distributed technologies; fostering technology transfer and innovation to ensure shared benefits and resilient development, for instance by building local value chains.
4. Parties should call on international financial institutions (IFIs), including multilateral development banks (MDBs), to increase coordination with other financiers to fill data gaps, co-develop programmes, and share best practices. Parties should also call on IFIs to strengthen partnerships with national and sub-national financial institutions to effectively channel the much-needed finance for these solutions, while enhancing transparency and standardisation.
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